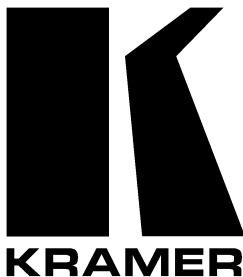


Kramer Electronics, Ltd.



USER MANUAL

Models:

TP-45, *Component/XGA – Audio Transmitter*

TP-46, *Component/XGA – Audio Receiver*

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1 Introduction

Welcome to Kramer Electronics (since 1981): a world of unique, creative and affordable solutions to the infinite range of problems that confront the video, audio and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 500-plus different models now appear in 8 Groups¹, which are clearly defined by function. Congratulations on purchasing your Kramer TOOLS **TP-45** *Component/XGA – Audio Transmitter* and Kramer TOOLS **TP-46** *Component/XGA – Audio Receiver*.

The **TP-45** and **TP-46** are suitable for utilizing existing UTP cabling that results in an efficient, fast and uncluttered environment for:

- Presentation and multimedia applications
- Long range graphics distribution for schools, hospitals, security, and stores
- Security and military applications

The package includes the following items:

- **TP-45** and/or **TP-46**
- Power adapter (12V DC Input)
- This user manual²

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables³

2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.

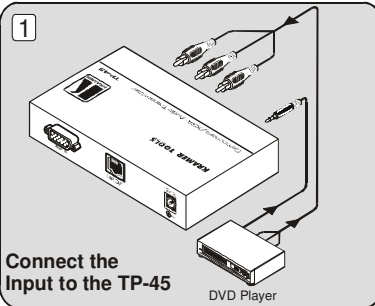
1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; and GROUP 8: Cables and Connectors

2 Download up-to-date Kramer user manuals from the Internet at this URL: <http://www.kramerelectronics.com>

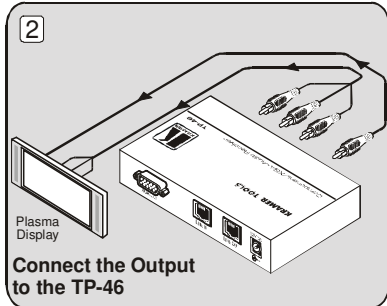
3 The complete list of Kramer cables is on our Web site at <http://www.kramerelectronics.com>

Connect the input and the output (Component Mode)

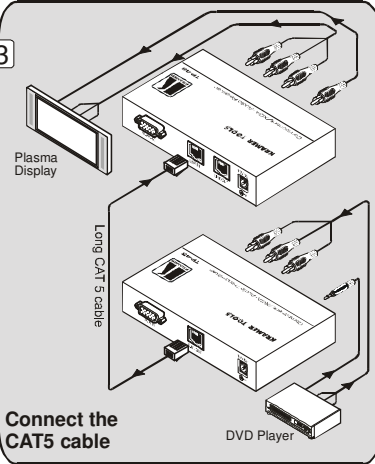
1



2

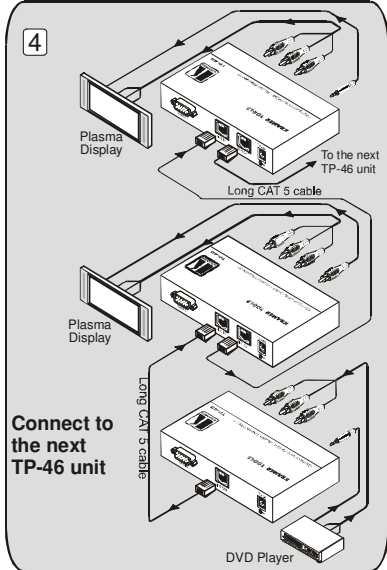


3



On the TP-45, set the Video SELECT button to COMP and the audio SELECT button to ANALOG

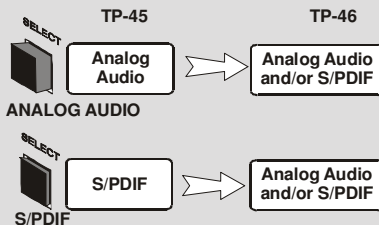
4



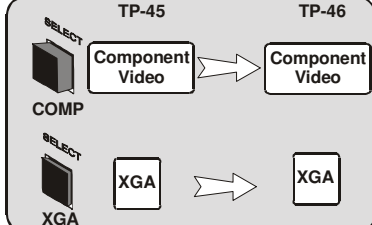
Connect the power

Connecting options:

AUDIO



VIDEO



3 Overview

This section describes:

- A summary of the **TP-45** / **TP-46**, see section 3.1
- The power connect feature, see section 3.2
- Using shielded twisted pair (STP) / unshielded twisted pair (UTP), see section 3.3
- Recommendations for achieving the best performance, see section 3.4

3.1 About the **TP-45** / **TP-46**

The **TP-45** has two SELECT buttons, letting you choose the video signal input (XGA¹ or component) as well as the audio input (digital or analog signal). By selecting the required video input signal, the **TP-45** with the **TP-46** can constitute either a component video (Y, CB/PB, CR/PR) or an XGA video – audio transmitter / receiver system²:

- If XGA is selected³, the **TP-45** receives an XGA signal⁴ and transmits it over the CAT5 cable to the XGA output on the **TP-46** receiver
- If component video is selected⁵, the component video signal⁴ is transmitted over the CAT5 cable to the COMP outputs on the **TP-46** receiver
- The analog audio or S/PDIF (digital audio) — as selected via the audio SELECT button — is transmitted together with the video signal over the CAT5 cable to the **TP-46** receiver

The audio signal is distributed simultaneously to the analog and digital audio outputs.

Additional **TP-46** units can be connected via the **TP-46** LINE OUT CAT5 connector, to extend the range of the output signals⁶.

1 The terminology XGA that is used throughout this manual implies resolutions up to UXGA

2 The TP-45 and TP-46 do not perform any video signal format conversion. Thus computer graphics sources need to be routed to computer graphics outputs. Similarly, component video sources need to be routed to component video outputs

3 By pressing the video SELECT button

4 And audio signal

5 By releasing the video SELECT button

6 You can connect up to three additional TP-46 units, adding a total cable length of up to 300 meters. The video quality may be reduced if further units are connected

The **TP-45** *Component/XGA – Audio Transmitter*:

- Has a transmission range of more than 300 ft. (more than 100 meters)
- Includes a YUV¹ input on 3 RCA connectors and an XGA input on an HD15F connector
- Includes a digital audio input (S/PDIF) on an RCA connector and a stereo analog input on a 3.5mm mini jack
- Can power or be powered by the receiver over the same CAT5 cable (see section 3.2)
- Is 12VDC fed

The **TP-46** *Component/XGA – Audio Receiver*:

- Has a YUV¹ output on 3 RCA connectors and an XGA output on an HD15F connector
- Includes a digital audio output (S/PDIF) on an RCA connector and a stereo analog output on a 3.5mm mini jack
- Can power or be powered by the transmitter over the same CAT5 cable (see section 3.2)
- Can change the polarity of decoding H and V Sync for XGA graphics
- Includes EQ. and LEVEL controls
- Features a CAT5 output for transmitting the signal to an additional receiver
- Is 12VDC fed

3.2 About the Power Connect Feature

The Power Connect feature lets you power a transmitter / receiver system by connecting just one power adapter— to either the transmitter or the receiver². The other unit is fed via the cable connecting between the transmitter/receiver. The Power Connect feature applies as long as the cable can carry power. The distance does not exceed 50 meters on standard CAT5 cable, for longer distances, heavy gauge cable should be used³.

For a CAT5 cable exceeding a distance of 50 meters, separate power supplies should be connected to the transmitter and to the receiver simultaneously.

Both units can be powered from the Kramer MultiTOOLS® **PT-1PS** CAT5 Power Supply.

¹ Also known as Y, Cb, Cr, or Y, B-Y, R-Y, or Y, Pb, Pr

² It is recommended to power the receiver (TP-46) when connecting just one power adapter

³ CAT5 cable is still suitable for the video/audio transmission, but not for feeding the power at these distances

3.3 Shielded Twisted Pair (STP) / Unshielded Twisted Pair (UTP)

The decision whether to use shielded twisted pair (STP) cable or unshielded twisted pair (UTP) cable depends on the nature of the application.

It is recommended that in applications with high interference, shielded twisted pair (STP) cable is used. However, the shield itself does create a capacitance that degrades the frequency response of the machines. For shorter distances, of 50m or so, shielded twisted pair (STP) cable is preferred because it provides protection from interference (degradation is non apparent).

For a long-range application, unshielded twisted pair (UTP) cable is preferred. However, the unshielded twisted pair (UTP) cable should be installed far away from electric cables, motors and so on, which are prone to create electrical interference.

3.4 Recommendations for Achieving the Best Performance

To achieve the best performance:

- Connect only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise-levels (often associated with low quality cables)
- Avoid interference from neighboring electrical appliances and position your **TP-45/TP-46** away from moisture, excessive sunlight and dust



Caution – No operator-serviceable parts inside unit.

Warning – Use only the Kramer Electronics input power wall adapter that is provided with this unit¹.

Warning – Disconnect power and unplug unit from wall before installing or removing device or servicing unit.

¹ For example: model number AD2512C, part number 2535-000251

4 Your Component/XGA – Audio Transmitter and Receiver

This section describes the:

- **TP-45** *Component/XGA – Audio Transmitter*, see section 4.1
- **TP-46** *Component/XGA – Audio Receiver*, see section 4.2

4.1 Your TP-45 Component – S/PDIF Line Transmitter

Figure 1, Figure 2 and Table 1 define the **TP-45**:

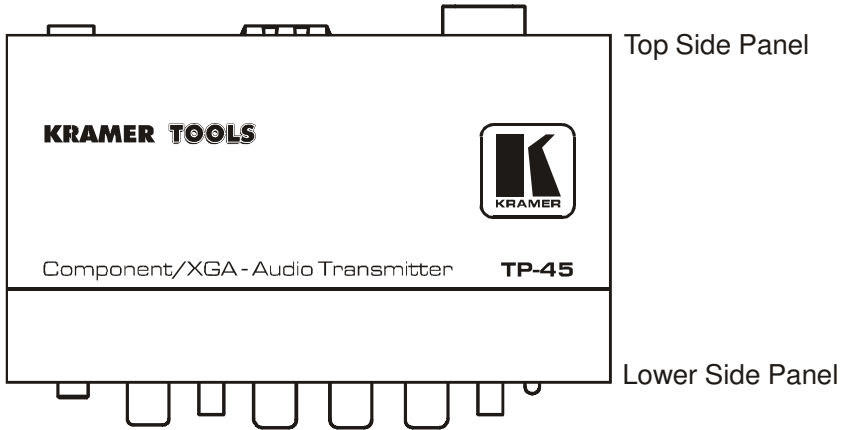


Figure 1: TP-45 Component/XGA – Audio Transmitter

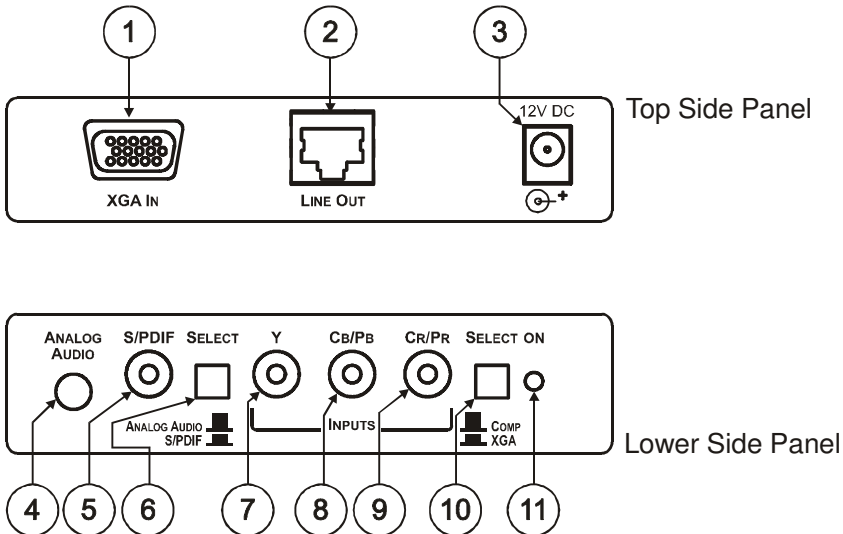


Figure 2: TP-45 (Top Side and Lower Side Panels)

Table 1: TP-45 Component/XGA – Audio Transmitter Features

#	Feature		Function
1	XGA IN HD15F Connector		Connect to the XGA source
2	LINE OUT RJ-45 Connector		Connect to the <i>LINE IN</i> connector on the TP-46¹
3	12V DC		+12V DC connector for powering the unit
4	ANALOG AUDIO 3.5mm Mini connector		Connect to the stereo analog audio source
5	S/PDIF RCA Connector		Connect to the digital audio source
6	SELECT Audio Input Selector Button	ANALOG AUDIO	Release to transmit analog audio
		S/PDIF	Press to transmit digital audio
7	INPUTS	Y RCA Connector	Connect to the component video source
8		CB/PB RCA Connector	
9		CR/PR RCA Connector	
10	SELECT Video Input Selector Button	COMP	Release to transmit component video
		XGA	Press to transmit XGA
11	ON LED		Lights when receiving power

Figure 3 and Table 2 define the underside of the **TP-45**:

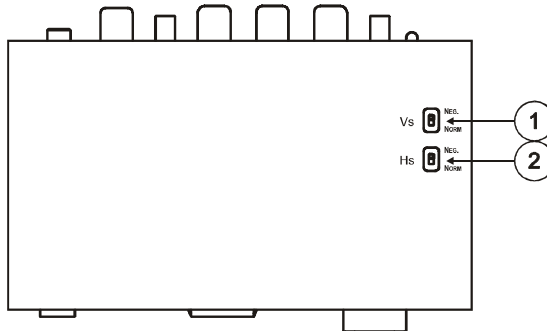


Figure 3: TP-45 Component/XGA – Audio Transmitter (Underside)

Table 2: TP-45 Component/XGA – Audio Transmitter (Underside) Features

#	Feature	Function
1	VS Switch	Slide the switch up ² (to NEG.) to change the VS polarity to negative polarity; slide the switch down (to NORM) to retain the polarity
2	HS Switch	Slide the switch up ² (to NEG.) to change the HS polarity to negative polarity; slide the switch down (to NORM) to retain the polarity

¹ Using a straight pin to pin UTP cable with RJ-45 connectors at both ends (the PINOUT is defined in Table 5 and Figure 9)

² By default, both switches are set to NORM

4.2 Your TP-46 Component/XGA – Audio Receiver

Figure 4, Figure 5 and Table 3 define the **TP-46**:

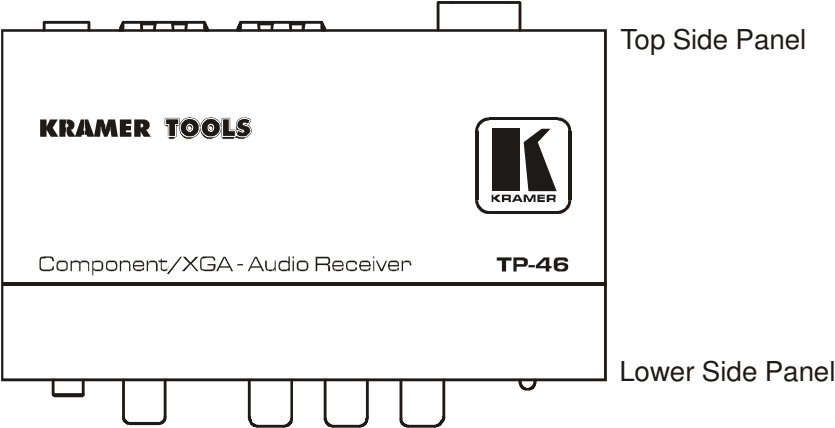


Figure 4: TP-46 Component/XGA – Audio Receiver

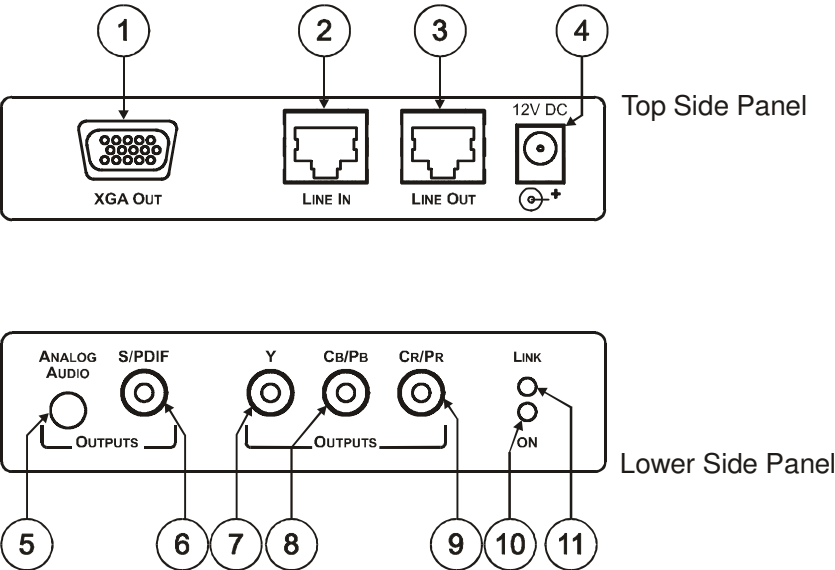


Figure 5: TP-46 (Top Side and Lower Side Panels)

Table 3: TP-46 Component/XGA – Audio Receiver Features

#	Feature	Function
1	XGA OUT HD15F Connector	Connect to the XGA acceptor
2	LINE IN RJ-45 Connector	Connect to the LINE OUT RJ-45 connector on the TP-45 ¹
3	LINE OUT RJ-45 Connector	Connect to the LINE IN connector on an additional TP-46 ¹
4	12V DC	+12V DC connector for powering the unit
5	OUTPUTS	ANALOG AUDIO 3.5mm Mini connector
6		S/PDIF RCA Connector
7		Y RCA Connector
8		CB/PB RCA Connector
9		CR/PR RCA Connector
10	ON LED	Lights when receiving power
11	LINK LED	Lights when receiving the correct input signal

Figure 6 and Table 4 define the underside of the **TP-46**:

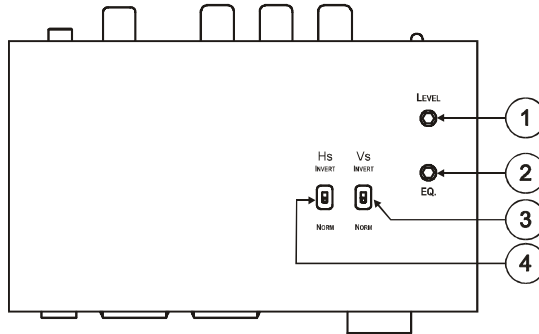


Figure 6: TP-46 Component/XGA – Audio Receiver (Underside)

Table 4: TP-46 Component/XGA – Audio Receiver (Underside) Features

#	Feature	Function
1	LEVEL Trimmer	Adjusts ² the output signal level
2	EQ. ³ Trimmer	Adjusts ² the cable compensation equalization level
3	VS Switch	Slide the switch down (to NORM) to retain the polarity Slide the switch up ⁴ (to INVERT) to invert the VS polarity
4	HS Switch	Slide the switch down (to NORM) to retain the polarity Slide the switch up ² (to INVERT) to invert the HS polarity

1 Using a UTP cable with CAT5 connectors at both ends (the PINOUT is defined in Table 5 and Figure 9)

2 Use a screwdriver to carefully rotate the trimmer, adjusting the appropriate level

3 Degradation and VGA/XGA signal loss can result from using long cables (due to the effects of stray capacitance, for example), sometimes leading to a loss of sharpness in high-resolution signals

4 By default, both switches are set to NORM

5 Connecting a Component/XGA – Audio Distribution System

The Component/XGA – audio distribution system can be configured to operate in one of two modes:

- In the XGA mode, a computer graphics source is connected to the input and transmitted to a display connected to the receiver (see section 5.1)
- In the component video mode, a component video source is connected to the input and transmitted to a TV set connected to the receiver (see section 5.2)

Additional **TP-46** units can be connected to distribute the output signal¹.

It is possible to connect both XGA and component video inputs and outputs and select the required mode via the video SELECT button².

The selected³ audio input (analog or digital signal) is available on both audio outputs.

5.1 Connecting TP-45 and TP-46 in the XGA Mode

To configure a **TP-45 / TP-46** Component/XGA – Audio distribution system⁴ in the XGA mode, as illustrated in the example in Figure 7, do the following:

1. On the **TP-45**, connect the following:
 - An XGA source (for example, a laptop's graphics card) to the XGA IN HD15F connector
 - An analog audio source to the ANALOG AUDIO 3.5mm mini jack⁵, for example, using a Kramer C-GMA/GMA cable (VGA HD15M +Audio jack to VGA HD15M +Audio jack)⁶.
2. If necessary, set the HS and VS switches on the **TP-45** underside⁷.
3. Using the SELECT buttons:
 - Press the video SELECT button to choose XGA
 - Release the audio SELECT button to choose ANALOG AUDIO⁸

1 You can connect up to three additional TP-46 units, adding a total cable length of up to 300 meters. The video quality may be reduced if further units are connected

2 Only the output that is related to the selected mode will be available (XGA for the XGA mode, and component video for the COMP mode)

3 Via the audio SELECT button

4 Using up to 300ft (100m) of UTP cabling

5 Or you can connect a digital audio source to the S/PDIF RCA connector

6 Not supplied. The complete list of Kramer cables is on our Web site at <http://www.kramerelectronics.com>

7 By default, both switches are set down (for normal V SYNC and H SYNC polarity)

8 If the digital audio input is connected, press the button to select S/PDIF

4. On the **TP-46**, connect the following:
 - The XGA OUT HD15F connector to the XGA acceptor (for example, a display)
 - The ANALOG AUDIO 3.5mm mini jack¹ to the analog audio acceptor (for example, speakers).
5. Connect the LINE OUTPUT RJ-45 connector on the **TP-45** to the LINE IN RJ-45 connector on the **TP-46**, via CAT5 cabling, see section 5.3.
6. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity on both² the **TP-45** and the **TP-46** (not shown in Figure 7).

The signal from the XGA source is transmitted via CAT5 cable, decoded and converted at the XGA OUT HD15F connector to the XGA acceptor.
7. If required, connect the LINE OUT RJ-45 connector on the **TP-46** to an additional **TP-46**.
8. On the **TP-46** underside:
 - Adjust³ the video output signal level and/or cable compensation equalization level, if required
 - If necessary, set the HS and VS switches⁴, on the underside

1 Alternatively, you can connect a digital audio acceptor to the S/PDIF RCA connector, or you can connect both

2 If you cannot connect the power to both the TP-45 and TP-46, you can just connect the power to the TP-46

3 Use a screwdriver to carefully rotate the trimmer, adjusting the appropriate level

4 By default, both switches are set down (for normal V SYNC and H SYNC polarity)

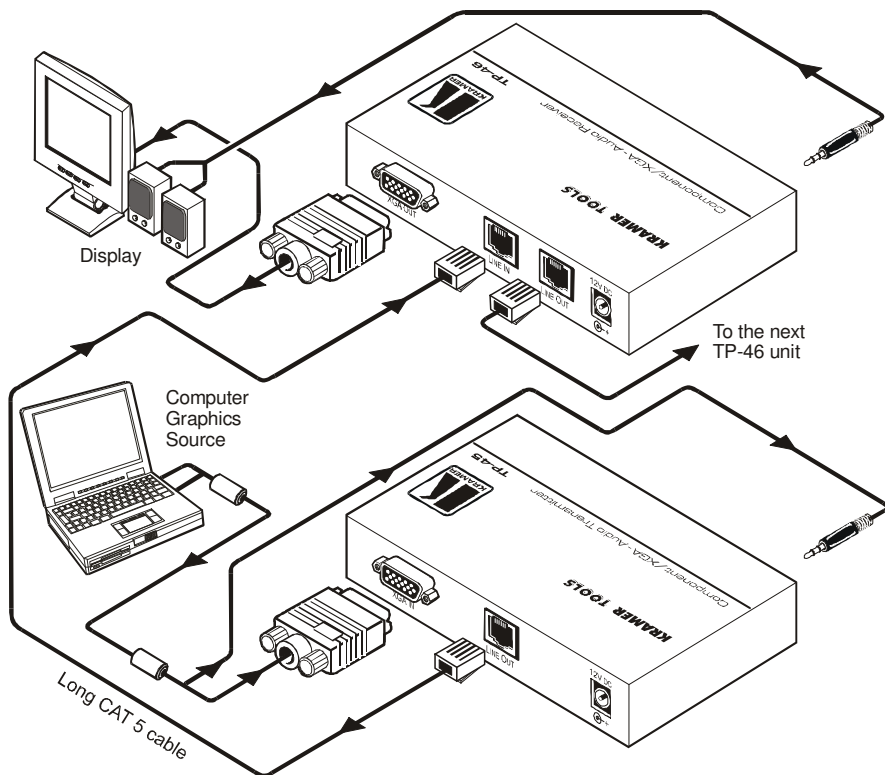


Figure 7: Component/XGA – Audio Distribution System, XGA Mode

5.2 Connecting TP-45 and TP-46 in the Component Video Mode

To configure a **TP-45/TP-46** Component/XGA – Audio distribution system¹ in the component video mode, as the example in Figure 8 illustrates, do the following:

1. On the **TP-45**, connect the following:
 - A component video source (for example, a DVD player) to the Y, CB/PB, CR/PR RCA connectors
 - A digital audio source to the S/PDIF RCA connector²
2. If necessary, set the HS and VS switches³, on the **TP-45** underside.

¹ Using up to 300ft (100m) of UTP cabling

² Alternatively, you can connect an analog audio source

³ By default, both switches are set down (for normal V SYNC and H SYNC polarity)

3. Using the SELECT buttons:
 - Release the video SELECT button to choose COMP
 - Press the audio SELECT button to choose S/PDIF¹
4. On the **TP-46**, connect the following:
 - The Y, CB/PB, CR/PR RCA connectors to a component video acceptor (for example, a plasma display)
 - The S/PDIF RCA connector² to the digital audio acceptor (for example, the audio input on the plasma display)
5. Connect the LINE OUTPUT RJ-45 connector on the **TP-45** to the LINE IN RJ-45 connector on the **TP-46**, via CAT5 cabling, see section 5.3.
6. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity on both³ the **TP-45** and the **TP-46** (not shown in Figure 8).

The signal from the component video source is transmitted via the CAT5 cable; decoded and converted to component video and outputted on the Y, CB/PB, CR/PR OUTPUTS RCA connectors to the component video acceptor.
7. Connect the LINE OUT RJ-45 connector on the **TP-46** to a second **TP-46** unit⁴ (optional).
8. Similarly, you can connect the LINE OUT RJ-45 connector on the **TP-46** to additional **TP-46** units.
9. On the **TP-46** underside:
 - If required, adjust⁵ the video output signal level and/or cable compensation equalization level⁶
 - If necessary, set the HS and VS switches⁷, on the underside

1 If the analog audio input is connected, release the button to select ANALOG

2 Alternatively, you can connect an analog audio acceptor, or you can connect both

3 If you cannot connect the power to both the TP-45 and TP-46, connect it to the TP-46 only. If more than one TP-46 is connected, connect the power to each TP-46 unit

4 Connect the required outputs to the second TP-46

5 Use a screwdriver to carefully rotate the trimmer, adjusting the appropriate level

6 If more than one TP-46 unit is connected, adjust the level and cable compensation in sequence from the first TP-46 unit (that is connected directly to the TP-45) and on

7 By default, both switches are set down (for normal V SYNC and H SYNC polarity)

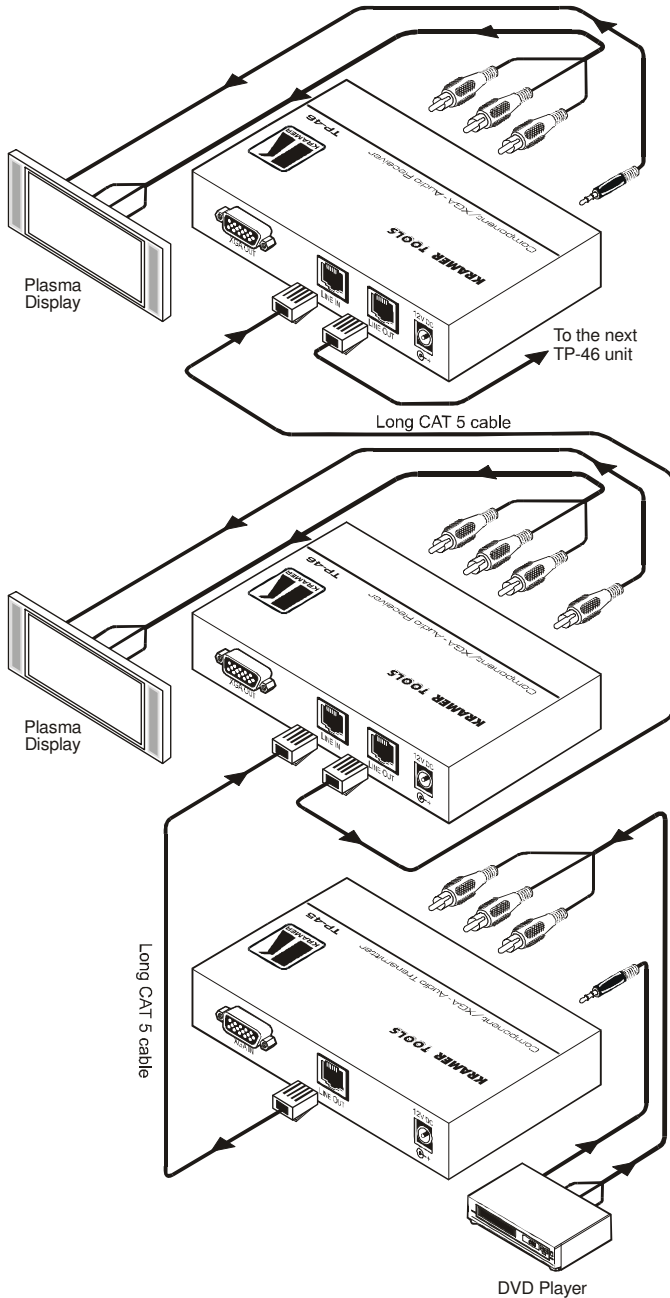


Figure 8: Component/XGA – Audio Distribution System, Component Video Mode

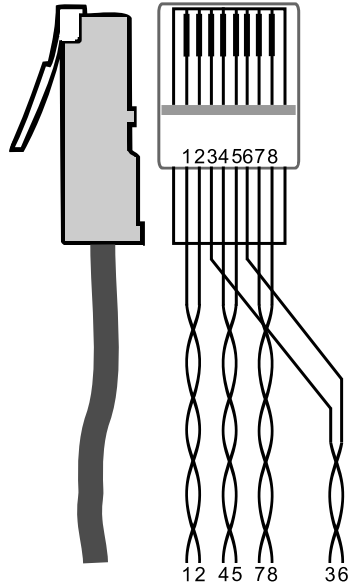
5.3 Wiring the CAT5 LINE IN / LINE OUT RJ-45 Connectors

Table 5 and Figure 9 define the CAT5 PINOUT, using a straight pin-to-pin cable with RJ-45 connectors:

Table 5: CAT5 PINOUT

EIA / TIA 568A		EIA / TIA 568B	
PIN	Wire Color	PIN	Wire Color
1	Green / White	1	Orange / White
2	Green	2	Orange
3	Orange / White	3	Green / White
4	Blue	4	Blue
5	Blue / White	5	Blue / White
6	Orange	6	Green
7	Brown / White	7	Brown / White
8	Brown	8	Brown
Pair 1		Pair 1	4 and 5
Pair 2		Pair 2	1 and 2
Pair 3		Pair 3	3 and 6
Pair 4		Pair 4	7 and 8

Figure 9: CAT5 PINOUT



6 Technical Specifications

Table 6 defines the technical specifications¹:

Table 6: Technical Specifications² of the TP-45 / TP-46

VIDEO Specifications	
INPUTS:	TP-45: 1 VGA/UXGA 1Vpp/75Ω on an HD15 connector 1 component 1Vpp/75Ω (Y,Pb,Pr) on 3 RCA connectors TP-46 1 CAT-5 line In on an RJ-45 connector (video/audio)
OUTPUTS:	TP-45: 1 CAT-5 line Out on an RJ-45 connector (video/audio) TP-46: 1 CAT-5 line Extension on an RJ-45 connector (video/audio) 1 VGA/UXGA 1Vpp/75Ω on an HD15 connector 1 component 1Vpp/75Ω (Y,Pb,Pr) on 3 RCA connectors
MAX. INPUT LEVEL:	VGA: 1.2Vpp on 75Ω, DC coupling Y,Pb,Pr: 1.05Vpp on 75Ω, AC coupling
RETURN LOSS:	-18dB
MAX. OUTPUT LEVEL:	VGA: 1.5Vpp on 75Ω, DC coupling Y,Pb,Pr: 1.25Vpp on 75Ω, DC coupling
RESOLUTION:	Up to UXGA; 1080p
S/N RATIO:	60dB RMS unweighted; 69dB RMS @5MHz weighted
K-FACTOR:	0.2% @ optimal equalization
ISOLATION (CROSSTALK):	-43dB @ 5MHz
AUDIO Specifications	
INPUTS:	TP-45: 1 Stereo analog audio, 0dBu/50kΩ, 0.5V/75Ω, on a 3.5mm jack 1 digital S/PDIF audio on an RCA connector
OUTPUTS:	TP-46 1 Stereo analog audio, 0dBu/1kΩ, 0.5V/75Ω, on a 3.5mm jack 1 digital S/PDIF audio on an RCA connector
MAX. INPUT LEVEL ANALOG:	4dBu on 50kΩ, AC coupling
MAX. OUTPUT LEVEL ANALOG:	4dBu on 1kΩ, DC coupling
BANDWIDTH:	20Hz to 20kHz, @ 0dBu
TND+NOISE:	0.33% @ 0dBu @ 1kHz
MAX. INPUT LEVEL S/PDIF:	1Vpp on 75Ω, AC coupling
MAX. OUTPUT LEVEL S/PDIF:	0.7Vpp on 75Ω, AC coupling
SAMPLE RATE CONVERSION:	48kHz
RESOLUTION CONVERSION:	24 bits
POWER SOURCE:	TP-45: 12VDC, 140mA TP-46: 12VDC, 280mA
DIMENSIONS:	12 cm x 7.15 cm x 2.76 cm (4.7" x 2.81" 1.09", W, D, H)
WEIGHT:	0.3 kg (0.67 lbs.) approx
ACCESSORIES:	Power Supply

¹ Specifications for 100m of CAT5 UTP cable, unless otherwise specified

² Specifications are subject to change without notice

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed.
3. Damage, deterioration or malfunction resulting from:
 - i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
 - ii) Product modification, or failure to follow instructions supplied with the product
 - iii) Repair or attempted repair by anyone not authorized by Kramer
 - iv) Any shipment of the product (claims must be presented to the carrier)
 - v) Removal or installation of the product
 - vi) Any other cause, which does not relate to a product defect
 - vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

- EN-50081: "Electromagnetic compatibility (EMC);
generic emission standard.
Part 1: Residential, commercial and light industry"
- EN-50082: "Electromagnetic compatibility (EMC) generic immunity standard.
Part 1: Residential, commercial and light industry environment".
- CFR-47: FCC Rules and Regulations:
Part 15: "Radio frequency devices
Subpart B – Unintentional radiators"

CAUTION!

- ☒ Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- ☒ Use the supplied DC power supply to feed power to the machine.
- ☒ Please use recommended interconnection cables to connect the machine to other components.





For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com, where updates to this user manual may be found. We welcome your questions, comments and feedback.



Caution

Safety Warning:

Disconnect the unit from the power supply before opening/servicing.



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E-mail: info@kramerel.com

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